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PATENT
Customer No. 22,852
Attorney Docket No. 02860.0656-00

OIPE JC73 AUG 2 9 2005 PATENT & TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	)	
	)	
Shigeru HOSOE et al.	)	Group Art Unit: 2653
	)	
Application No.: 09/670,839	)	Examiner: A. M. Psitos
	)	
Filed: September 28, 2000	)	
	)	
For: OPTICAL ELEMENT HAVING A LOW SURFACE ROUGHNESS, AN OPTICAL PICKUP DEVICE INCLUDING THE OPTICAL ELEMENT, AND A DIE FOR MAKING THE OPTICAL ELEMENT	)	Confirmation No.: 7690

Mail Stop Appeal Brief--Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

TRANSMITTAL OF APPEAL BRIEF (37 C.F.R. 41.37)

Transmitted herewith is the APPEAL BRIEF in this application with respect to the Notice of Appeal filed on June 29, 2005.

This application is on behalf of

☐ Small Entity ☒ Large Entity

Pursuant to 37 C.F.R. 41.20(b)(2), the fee for filing the Appeal Brief is:

☐ $250.00 (Small Entity)

☒ $500.00 (Large Entity)

TOTAL FEE DUE:

☒ Enclosed is a check for $500.00 to cover the Appeal Brief fee.

PETITION FOR EXTENSION. If any extension of time is necessary for the filing of this Appeal Brief, and such extension has not otherwise been requested, such an extension is hereby requested, and the Commissioner is authorized to charge necessary fees for such an extension to our Deposit Account No. 06-0916. A duplicate copy of this paper is enclosed for use in charging the deposit account.

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: August 29, 2005

By: ______________________
Michael R. Kelly
Reg. No. 33,921

PATENT
Customer No. 22,852
Attorney Docket No. 02860.0656-00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
Shigeru HOSOE et al.	Group Art Unit: 2653
Application No.: 09/670,839	Examiner: A. M. Psitos
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For: OPTICAL ELEMENT HAVING A LOW SURFACE ROUGHNESS, AN OPTICAL PICKUP DEVICE INCLUDING THE OPTICAL ELEMENT, AND A DIE FOR MAKING THE OPTICAL ELEMENT	Confirmation No.: 7690

Attention: Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF UNDER BOARD RULE § 41.37

In support of the Notice of Appeal filed June 29, 2005, and further to Board Rule 41.37, Appellants present this brief and enclose herewith a check for the fee of $500.00 required under 37 C.F.R. § 1.17(c).

This Appeal responds to the March 31, 2005 final rejection of claims 1-8, 10-18, 22-26, and 28-30.

If any additional fees are required or if the enclosed payment is insufficient, Appellant requests that the required fees be charged to Deposit Account No. 06-0916.

I. REAL PARTY IN INTEREST

Konica Minolta Corporation is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

There are currently no other appeals or interferences, of which Appellants, Appellants' legal representative, or assignee are aware, that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-8, 10-18, 22-26, and 28-30 stand rejected; claims 9, 19-21, and 27 have been cancelled. The rejections of claims 1-8, 10-18, 22-26, and 28-30 is appealed.

IV. STATUS OF AMENDMENTS

No amendments after final have been filed.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claims of this application recite an optical pickup device and an optical element. Such an optical element may be used, for example, to read information from and write information to an optical disk. Other claims recite a molding die for an optical element.

Conventional CD readers employ a light source emitting light of a wavelength of about 780 nm, while DVD readers employ a light source emitting light with a wavelength of about 650 nm. In contrast, the next generation of optical media readers are expected to employ light sources emitting light having wavelengths of less than 500 nm (Application page 3). As shown in Table 1 on page 3 of the application, Rayleigh scattering suddenly increases as the wavelength of light decreases to 500 nm or less.

In the next generation optical readers, as the light wavelength becomes 500 nm or less, the optical elements become more important. In particular, the surface roughness of the optical element influences the performance of reading and recording information from and to an optical recording medium. The present inventors recognized and responded to this influence (Application page 4).

Independent claim 1 recites an optical pickup device for recording and/or reproducing information in an optical information recording medium (Figure 8 and Figure 9). The device includes a light source emitting light flux having a central wavelength not more than 500 nm (Figure 8, light source 22, Application page 41), a converging optical system (Figure 8, objective lens 27, Application page 42), and an optical detector (Figure 8, light receiving sensor 23, Application page 41). The converging optical system or the optical detector comprises at least one optical element, and that optical element comprises at least one optical surface having a center-line mean roughness Ra not more than 5 nm (Application pages 42-43).

Independent claim 13 recites an optical element comprising at least one optical surface (Figure 2, lens 1, surface 1a or surface 1b). The optical surface has a center-line mean roughness Ra not more than 5 nm (Application page 39) and at least one surface of the optical surface of the optical element has a reflectance not more than 3% for light having at least a wavelength of 300 nm to 500 nm (Application page 28).

Independent claim 25 recites an optical information recording and/or reproducing apparatus for recording and/or reproducing information in an optical information recording medium (Figure 8 and Figure 9) comprising an optical pickup device and an optical detector (Figure 8, light receiving sensor 23, Application page 41). The optical

pickup device includes a light source emitting light flux having a central wavelength not more than 500 nm (Figure 8, light source 22, Application page 41) and a converging optical system (Figure 8, objective lens 27, Application page 42). The converging optical system or the optical detector comprises at least one optical element, and that optical element comprises at least one optical surface having a center-line mean roughness Ra not more than 5 nm

Independent claim 26 recites a molding die for an optical element (Figure 1) comprising a molding surface (Figure 1, molding surface 11a or molding surface 12a), wherein the molding surface comprises at least one aspherical surface having a center-line mean roughness Ra not more than 5 nm.

Independent claim 28 recites a method of manufacturing a molding die for an optical element. The method comprises the steps of cutting a material of the molding die with a super precision lathe and a diamond tool and forming an optical surface transferring surface in the molding die (Application pages 55-57). The optical surface transferring surface comprises at least one surface having a center-line mean roughness Ra not more than 5 nm (Application page 55).

VI. GROUNDS OF REJECTION

A. Claims 1-4, 6, 10, and 25 stand rejected under 35 U.S.C. § 103(a) in view of Ueda et al., U.S. Patent 5,481,530 and Hibino et al., U.S. Patent 6,119,485

B. Claim 5 stands rejected under 35 U.S.C. § 103(a) in view of Ueda et al., Hibino et al., and Inoue et al., U.S. Patent 5,759,457.

C. Claims 7 and 8 stand rejected under 35 U.S.C. §103(a) in view of Ueda et al., Hibino et al., and Sato et al., U.S. Patent 5,181,141.

D. Claims 11 and 12 stand rejected under 35 U.S.C. § 103(a) in view of Ueda et al., Hibino et al., and Ueda et al., U.S. Patent 6,314,064.

E. Claims 13-14, 18, and 30 stand rejected under 35 U.S.C. § 103(a) in view of Hibino et al. and Sato et al.

F. Claims 15, 16, 22, 23, and 24 stand rejected under 35 U.S.C. § 103(a) in view of Ueda et al. Hibino et al., and Ueda et al. ('064).

G. Claim 26 stands rejected under 35 U.S.C. § 102(e) as anticipated by Hibino et al.

H. Claim 28 stands rejected under 35 U.S.C. § 103(a) in view of Japanese Published Patent Application No. 11-268920, Hibino et al., Kashiwagi et al., and Yamagata et al., Published PCT Application No. WO 00/17691.

I. Claim 29 stands rejected under 35 U.S.C. § 103(a) in view of the art applied to claim 28.

VII. ARGUMENT

In view of the following arguments, Applicants respectfully request the Board to reverse the Examiner's rejections of claims 1-8, 10-18, 22-26, and 28-30.

A. Claims 1-4, 6, 10, and 25 Patentably Distinguish Over Ueda et al., U.S. Patent 5,481,530, and Hibino et al., U.S. Patent 5,481,530

Ueda et al., according to the title, discloses a high density optical recording method and recording medium. A laser beam at a wavelength of not more than 500 nm irradiates onto a recording layer of an optical disk (col. 3, lines 23-25). As shown in figure 5, an objective lens focuses the laser beam at a wavelength of not more than 500 nm onto a recording layer of the optical disk. The objective lens of Ueda et al. must

have a numerical aperture of more than 0.55 and less than 0.70 (col. 4, lines 22-34). Ueda et al. does not disclose or mention the surface roughness of the objective lens.

Hibino et al., according to the title, discloses a press molding die and glass articles molded with the press molding die. Hibino et al. includes three examples. Example 1 is a die for press molding a glass substrate for a magnetic disk (col. 13, lines 19-22). Example 2 is method for manufacturing a glass substrate for a magnetic disk and a method for manufacturing a die for press-molding a glass substrate for a magnetic disk (col. 17, lines 16-22). The glass substrate of a magnetic disk is not an optical element. Magnetic heads, not optical pickups, read and write information to magnetic disks (See Hibino et al., col. 4, lines 65-67).

Example 3 of Hibino et al. is a method for manufacturing convex optical glass elements less than 2 mm in diameter and a method for manufacturing a die for press molding the optical glass elements (col. 19, lines 54-60). Table 3, at column 22, shows the average surface roughness of such press-formed micro-lenses. According to Hibino et al., the small diameter micro-lenses have the same surface roughness as a polished glass surface (col. 20, lines 64-67).

One of ordinary skill in the art would not have been motivated to combine the disclosures of Ueda et al. and Hibino et al. as suggested by the Examiner. As discussed above and as disclosed in this application, optical element surface roughness increases in importance as the radiation wavelength decreases. As new optical disk readers use light having a wavelength less than 500 nm, the surface roughness of an optical element should be less than 5 nm. Consistent with this inventive insight, independent claims 1 and 25 limit both the wavelength and the corresponding surface

roughness. Neither Ueda et al. nor Hibino et al. discloses or suggests the correspondence between radiation wavelength and optical element surface roughness. Only the Applicants recognized and teach this correspondence.

In addition, one of ordinary skill in the art designing an optical pick-up device as disclosed in Ueda et al. would not have looked to the disclosure of Hibino et al. Hibino et al. merely discloses glass substrates for magnetic, not optical, disks and micro-lenses. Such glass substrates for magnetic disks are not within the field of optical pick-up devices and are of no interest to the person of ordinary skill in the art designing an optical pick-up device. In addition, there is no suggestion that the micro-lens of Hibino et al. could be substituted for the objective lens of Ueda et al. For example, there is no suggestion that the micro-lens of Hibino et al. provides the numeric aperture required by the optical system of Ueda et al.

Applicants therefore request reversal of the Examiner's rejection of claims 1-4, 6, 10, and 25.

B. Claim 5 Patentably Distinguishes Over Ueda et al., Hibino et al., and Inoue et al., U.S. Patent 5,759,457

Claim 5 depends from independent claim 1 and recites, "wherein the optical element is made of a resin material."

The rejection of claim 5 should be reversed for at least the same reasons as the rejection of claim 1; there is no motivation to combine Ueda et al. and Hibino et al. to achieve the claimed combination. Inoue et al. does not cure the deficiencies of Ueda et al. and Hibino et al.

In addition, Inoue et al. would not have motivated one of ordinary skill in the art to use resin material in Hibino et al.'s press-molding die. Inoue et al., according to the

patent's title, discloses a method for manufacturing an optical element. As stated in the abstract, a lens is manufactured by press molding an optical material such as glass or resin. Hibino et al., however, only discloses glass micro-lenses and selects molding die materials based upon glass micro-lenses. Hibino et al. thus fails to lead one of ordinary skill in the art to other materials, while Inoue et al. fails to suggest micro-lenses.

C. Claims 7 and 8 Patentably Distinguish Over Ueda et al., Hibino et al., and Sato et al., U.S. Patent 5,181,141

Claim 7 depends from independent claim 1 and recites, "a reflectance not more than 5% for light having a wavelength of 400 nm." Claim 8 depends from claim 1 and recites, "a reflectance not more than 3% for light having at least a wavelength of 300 nm to 500 nm."

The rejection of claims 7 and 8 should be reversed for at least the same reasons as the rejection of claim 1; there is no motivation to combine Ueda et al. and Hibino et al. to achieve the claimed combination. Sato et al. does not cure the deficiencies of Ueda et al. and Hibino et al.

Sato et al., according to the patent's title, discloses an anti-reflection optical element. The alleged invention of Sato et al. relates to an optical element used as an optical lens (e.g. opthalmic lens, camera lens), a filter, a polarizer, a semitransparent mirror, etc. (col. 1, lines 9-11). The optical element comprises an optical component and a multi-layered anti-reflection film provided directly or indirectly on the optical element (col. 2, lines 52-60). Figure 1 appears to show a reflectance of less than 3% for light have a wavelength between 380 nm and 500 nm (col. 18, line 66 to col. 19, line 3).

There is no motivation in the prior art to combine the optical element of Sato et al. with the optical pickup apparatus of Ueda et al. Because Sato et al. discloses a multi-layered anti-reflection film directly or indirectly on an optical component, Sato et al. teaches away from any optical element disclosed in Ueda et al. or Hibino et al. Indeed, Sato et al. discloses ophalmic lenses and camera lenses. One of ordinary skill in the art designing a glass micro-lens such as disclosed in Hibino et al. would not have looked to the disclosure of Sato et al.

D. Claims 11 and 12 Patentably Distinguish Over Ueda et al., Hibino et al., and Ueda et al., U.S. Patent 6,314,064

Claim 11 depends from independent claim 1 and recites, "wherein the optical element is a collimator lens of the converging optical system." Claim 12 depends from independent claim 1 and recites, "wherein the optical element is an optical element for a sensor of the optical detector."

The rejection of claims 7 and 8 should be reversed for at least the same reasons as the rejection of claim 1; there is no motivation to combine Ueda et al. and Hibino et al. to achieve the claimed combination. Ueda et al. ('064) does not cure the deficiencies of Ueda et al. and Hibino et al.

E. Claims 13, 14, 18, and 30 Patentably Distinguish Over Hibino et al. and Sato et al.

Independent claim 13 recites an optical element comprising at least one optical surface. The optical surface has a center-line mean roughness Ra not more than 5 nm and at least one surface of the optical surface of the optical element has a reflectance not more than 3% for light having at least a wavelength of 300 nm to 500 nm. Surface

roughness and reflectance are not functional limitations, but describe physical properties of the claimed optical element.

The prior art cited by the Examiner fails to teach or suggest the claimed combination including, but not limited to, a surface roughness Ra not more than 5 nm and a reflectance not more than 3% for light having at least a wavelength of 300 nm to 500 nm. In particular, Hibino et al. fails to disclose or suggest the claimed combination of surface roughness and wavelength; Hibino et al. only discloses the surface roughness of a micro-lens. Contrary to the Examiner's suggestion, Hibino et al. does not mention reflective layers in connection with the micro-lens example (See Hibino et al., col. 19, lines 53 to col. 22, line 44). In addition, while the Examiner relies upon Sato et al. as disclosing the relationship between reflectance and wavelength, Sato et al. fails to disclose or mention surface roughness.

One of ordinary skill in the art would not have been motivated to combine the disclosures of Hibino et al. and Sato et al. as suggested by the Examiner. For example, Sato et al. discloses a multi-layered anti-reflection film directly or indirectly on an optical component and thus teaches away from the glass micro-lens disclosed in Hibino et al.

F. Claims 15, 16, 22, 23, and 24 Patentably Distinguish Over Ueda et al. Hibino et al., and Ueda et al. ('064)

Claims 15, 16, 22, 23, and 24 all depend from independent claim 13 and are patentable for at least the same reasons as claim 13.

In addition, dependent claims 15 and 16 recite an optical element having an aspherical surface with a center-line mean roughness Ra not more than 5 nm . None of the references cited by the Examiner disclose such an aspherical surface. In particular, Hibino et al. fails to disclose an optical element having an aspherical surface.

G. Hibino et al. Does Not Anticipate Claim 26

Independent claim 26 recites a molding die for an optical element. The claimed molding die comprises at least one aspherical surface having a center-line mean roughness Ra of not more than 5 nm.

Hibino et al. discloses, a base material having "an average roughness of less than 5 nm" (col. 4, lines 50-52). That particular base material has the inverse shape of a substrate for a magnetic disk (col. 4, lines 56-59). A magnetic disk is not an optical element. In addition, the substrate for a magnetic disk and the corresponding mold will not have an aspherical surface. Hibino et al. fails to disclose a die for an optical element having an aspherical surface and thus fails to anticipate claim 26.

The Examiner's rejection of claim 26 as anticipated by Hibino et al. should be reversed.

H. Claim 28 Patentably Distinguishes Over Japanese Published Patent Application No. 11-268920, Hibino et al., Kashiwagi et al., and Yamagata et al.

Independent claim 28 recites a method of manufacturing a molding die for an optical element. The method comprises the steps of cutting a material of the molding die with a super precision lathe and a diamond tool and forming an optical surface transferring surface in the molding die. The optical surface transferring surface comprises at least one surface having a center-line mean roughness Ra not more than 5 nm.

Applicants respectfully submit that the prior art cited by the Examiner fails to teach, disclose, or suggest the method recited in independent claim 28. The Examiner relies on Yamagata et al. as disclosing a "diamond tool", but apparently admits that

Yamagata et al. does not disclose an "Ra of 5 nm or less." In addition, while Kashiwagi et al. discloses a diamond tool (col. 6, lines 7-9), Kashiwagi et al., according to Applicants, fails to disclose a super precision lathe or the combination of a super precision lathe and a center-line mean roughness Ra not more than 5 nm.

I. Claim 29 Patentably Distinguishes Over Japanese Published Patent Application No. 11-268920, Hibino et al., Kashiwagi et al., and Yamagata et al.

Claim 29 depends from independent claim 28 and is patentable for at least the reasons discussed above for claim 28.

J. Conclusion

For the reasons given above, pending claims 1-8, 10-18, 22-26, and 28-30 are allowable and reversal of the Examiner's rejection is respectfully requested.

To the extent any extension of time under 37 C.F.R. § 1.136 is required to obtain entry of this Appeal Brief, such extension is hereby respectfully requested. If there are any fees due under 37 C.F.R. §§ 1.16 or 1.17 which are not enclosed herewith, including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.

Dated: August 29, 2005

By: ____________________
Michael R. Kelly
Reg. No. 33,921

VIII. CLAIMS APPENDIX TO APPEAL BRIEF UNDER RULE 41.37(C)(1)(VIII)

1. An optical pickup device for recording and/or reproducing information in an optical information recording medium, comprising:

a light source to emit light flux having a central wavelength not more than 500 nm;

a converging optical system to converge the light flux emitted from the light source onto an information recording surface of the optical information recording medium; and

an optical detector to detect light flux reflected from the information recording surface of the optical information recording medium or the light flux passing through the information recording surface of the optical information recording medium;

wherein the converging optical system or the optical detector comprises at least one optical element and the optical element comprises at least one optical surface having a center-line mean roughness Ra not more than 5 nm.

2. The optical pickup device of claim 1, wherein the optical element has the optical surfaces having a center-line mean roughness Ra not more than 5 nm on both side surfaces thereof.

3. The optical pickup device of claim 1, wherein the optical surface of the optical element having a center-line mean roughness Ra not more than 5 nm is an aspherical surface.

4. The optical pickup device of claim 2, wherein each of the both side surfaces of the optical element having a center-line mean roughness Ra not more than 5 nm is an aspherical surface.

5. The optical pickup device of claim 1, wherein the optical element is made of a resin material.

6. The optical pickup device of claim 1, wherein the optical element is made of a glass material.

7. The optical pickup device of claim 1, wherein at least one surface of the optical surface of the optical element has a reflectance not more than 5% for light having a wavelength of 400 nm.

8. The optical pickup device of claim 1, wherein at least one surface of the optical surface of the optical element has a reflectance not more than 3% for light having at least a wavelength of 300 nm to 500 nm.

9. (Cancelled).

10. The optical pickup device of claim 1, wherein the optical element is an objective lens of the converging optical system.

11. The optical pickup device of claim 1, wherein the optical element is a collimator lens of the converging optical system.

12. The optical pickup device of claim 1, wherein the optical element is an optical element for a sensor of the optical detector.

13. An optical element, comprising:

at least one optical surface;

wherein the optical surface has a center-line mean roughness Ra not more than 5 nm, and

wherein at least one surface of the optical surface has a reflectance not more than 3% for light having at least a wavelength of 300 nm to 500 nm.

14. The optical element of claim 13, wherein the optical element has the optical surfaces having a center-line mean roughness Ra not more than 5 nm on both side surfaces thereof.

15. The optical element of claim 13, wherein the optical surface of the optical element having a center-line mean roughness Ra not more than 5 nm is an aspherical surface.

16. The optical element of claim 14, wherein each of the both side surfaces of the optical element having a center-line mean roughness Ra not more than 5 nm is an aspherical surface.

17. The optical element of claim 13, wherein the optical element is made of a resin material.

18. The optical element of claim 13, wherein the optical element is made of a glass material.

19 through 21. (Cancelled).

22. The optical element of claim 13, wherein the optical element is an objective lens.

23. The optical element of claim 13, wherein the optical element is a collimator lens.

24. The optical element of claim 13, wherein the optical element is an optical element for a sensor.

25. An optical information recording and/or reproducing apparatus for recording and/or reproducing information in an optical information recording medium, comprising:

an optical pickup device comprising

a light source to emit light flux having a central wavelength not more than 500 nm;

a converging optical system to converge the light flux emitted from the light source onto an information recording surface of the optical information recording medium; and

an optical detector to detect light flux reflected from the optical information recording medium or the light flux passing through the optical information recording medium;

wherein the converging optical system or the optical detector comprises at least one optical element and the optical element comprises at least one optical surface having a center-line mean roughness Ra not more than 5 nm.

26. A molding die for an optical element; comprising:

a molding surface,

wherein the molding surface comprises at least one aspherical surface having a center-line mean roughness Ra not more than 5 nm.

27. (Cancelled).

28. A method of manufacturing a molding die for an optical element, comprising the steps of:

cutting a material of the molding die with a super precision lathe and a diamond tool; and

forming an optical surface transferring surface in the molding die;

wherein the optical surface transferring surface comprises at least one surface having a center-line mean roughness Ra not more than 5 nm.

29. The method of claim 28, wherein a tool roundness of the diamond tool is not more than 30 nm.

30. An optical element, comprising:

at least one optical surface;

wherein the optical surface has a center-line mean roughness Ra not more than 5 nm, and

at least one surface of the optical surface has a reflectance not more than 5% for light having a wavelength of 400 nm.